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Devoted Primarily to the Scientific Study of Problems of Learning and Teaching

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THE JOURNAL OF EDUCATIONAL PSYCHOLOGY is devoted primarily to the scientific study of problems of learning, teaching, and measurement of the psychological development of the individual. THE JOURNAL will contain articles on the following subjects: the psychology of school subjects; experimental studies of learning; the development of interests, attitudes, and personality, particularly as related to school adjustment; emotion, motivation, and character; mental development and methods. This last will include tests, statistical techniques, and research techniques in cross-sectional and developmental studies.

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ACTIVITIES AND PREFERENCES OF A SECONDARY-SCHOOL GROUP

PAUL WITTY AND ANNE COOMER
Northwestern University

In another article, we have presented data concerning high-school pupils' inclination to read the comics.[1] It was found that the reading of comic magazines was a popular pastime among high-school students. They read these magazines less frequently than younger pupils, but in every grade comic books

TABLE I.—NUMBER OF PUPILS
(Oak Park)

Grade	Number of Pupils		
	Girls	Boys	Both Sexes
IX	67	74	141
X	58	73	131
XI	49	50	99
XII	67	42	109
Totals	241	239	480

and strips were widely read. The average number of magazines read was 5.5 in the ninth grade; in the twelfth grade, it was 2.9. The pupils appeared to be much more interested in comic strips than in comic magazines; in fact, comic strips were read with high frequency in every grade. The average number read was 17.6; of these, 9.2 were perused regularly.

[1] *Cf.* "Reading the Comics in Grades IX–XII." *Ed. Adm. & Supv.*, May, 1942.

It will be interesting to examine other leisure pursuits of these same students. There were four hundred eighty in the entire group distributed by grade in the way indicated in Table I. The data were obtained during the week of April 27 to May 2,

TABLE II.—MEAN NUMBER OF MAGAZINES, OTHER THAN COMIC, READ
(Oak Park)

Grade	Mean Number Read		
	Girls	Boys	Both
IX	13.59	12.82	13.19
X	12.98	11.39	12.09
XI	12.51	12.40	12.45
XII	12.80	13.07	12.90
All grades	13.00	12.34	12.67

TABLE III.—MEAN FREQUENCY OF READING OF MAGAZINES, OTHER THAN COMIC
(Oak Park)

Grade	Mean No. Read Regularly			Mean No. Read Often			Mean No. Read Some		
	Girls	Boys	Both	Girls	Boys	Both	Girls	Boys	Both
IX	4.83	4.50	4.65	2.62	2.68	2.65	6.13	5.63	5.87
X	4.44	3.65	4.00	3.06	2.75	2.89	5.46	4.98	5.19
XI	3.28	3.98	3.63	3.14	2.70	2.91	6.08	5.72	5.89
XII	4.40	3.71	4.13	2.94	3.61	3.20	5.46	5.73	5.56
All Grades	4.30	3.99	4.15	2.92	2.87	2.90	5.77	5.47	5.62

1942, by the use of a questionnaire.[1] On a check-list, each pupil designated the magazines other than comic which he read regularly, often, and occasionally. The average number reported to have been read was between twelve and thirteen, both by the boys and by the girls. Table II shows that this average

[1] The writers are indebted to Supt. Eugene Youngert and Miss Lillian Remsburg of the Oak Park and River Forest Township High School for their coöperation in this study.

TABLE IV.—RANKING GIVEN BY HIGH-SCHOOL GIRLS AND BOYS TO THE TWENTY-FIVE MAGAZINES, OTHER THAN COMIC, GIVEN HIGHEST RANKING BY BOTH SEXES
(Oak Park)

Name of Magazine	Rank		
	Girls	Boys	Both Sexes
Reader's Digest	1.5	1.0	1.0
Life	3.0	2.0	2.0
Saturday Evening Post	6.0	3.0	3.0
Ladies' Home Journal	1.5	27.0	4.0
McCall's Magazine	4.0	30.0	5.0
Good Housekeeping	5.0	19.0	6.0
Collier's	7.0	10.0	7.0
National Geographic	10.0	7.0	8.0
Scholastic	9.0	11.5	9.0
Popular Science	34.0	4.0	10.0
Time	11.0	9.0	11.0
Popular Mechanics	29.5	5.0	12.0
American Magazine	8.0	17.0	13.0
Esquire	17.5	8.0	14.0
Look	12.5	11.5	15.5
Boys' Life	[3]	6.0	15.5
Newsweek	16.0	13.0	17.0
Junior Scholastic	19.0	16.0	18.0
Open Road for Boys	[2]	14.0	19.0
Cosmopolitan	14.0	30.0	20.0
Woman's Home Companion	12.5	[1]	21.0
American Girl	15.0	[2]	22.0
American Boy	[2]	15.0	23.5
Young America	24.5	18.0	23.5
Harpers	20.0	[3]	25.0

[1] Not listed by any person.
[2] Listed by one person.
[3] Listed by two persons.

remained quite constant from grade to grade. Of the magazines, about four were read regularly; and three, often. (See Table III.) This average is somewhat higher than that reported in other studies. Brink states: "it is apparent from these investigations [his] that high-school pupils read from two to three magazines regularly."[1]

The names of the popular magazines are assembled in Table IV. In this table, sex differences are somewhat pronounced. *Reader's Digest, Life,* and *The Saturday Evening Post* apparently have the most general appeal; magazines such as *McCall's* appeal strongly to girls while *Popular Science* and similar magazines are favorites with the boys. There appears to be little difference in the type of magazines which are popular in the four grades. Those magazines having highest appeal are popular in all grades; nor is there a tendency for the juniors and seniors to turn more often than freshmen to more mature or sophisticated magazines. Careful analyses of grade favorites were made, but comparisons revealed little difference from grade to grade.

TABLE V.—MEAN NUMBER OF BOOK TITLES REPORTED BY HIGH-SCHOOL GIRLS AND BOYS
(Oak Park)

GRADE	GIRLS	BOYS	BOTH SEXES
IX	4.40	3.37	3.86
X	3.87	3.84	3.86
XI	2.91	2.96	2.91
XII	3.77	6.80	4.94
All grades	3.80	4.03	3.91

The students were asked to give the titles of books they had read recently. Table V shows that the average number reported to have been read was about four; the eleventh-grade pupils cited a relatively small number of books while the twelfth-grade boys read a large number.

The titles of the books are extremely provocative. In Table VI it may be seen that the books are on the whole rather superior in quality; the list contains a generous assortment of good modern books. When comparisons are made from grade to grade, slight

[1] Brink, William G.: "High School Pupils' Interest in Magazines and Newspapers." *School Review,* Vol. XLVIII, January, 1940, p. 42.

TABLE VI.—RANKING GIVEN BY GIRLS AND BOYS TO THE BOOKS READ MOST FREQUENTLY BY BOTH SEXES
(Oak Park)

Name of Book	Rank		
	Girls	Boys	Both Sexes
Berlin Diary	1.0	2.0	1.0
Out of the Night	3.0	1.0	2.0
Red Badge of Courage	2.0	5.0	3.0
Galsworthy's Representative Plays	5.0	11.0	5.0
Green Mansions	4.0	15.0	5.0
Mein Kampf	8.5	4.0	5.0
Sergeant York	22.0	3.0	6.0
Tale of Two Cities	6.0	17.5	7.0
Call of the Wild	16.5	6.5	9.5
Inside Europe	16.5	6.5	9.5
Hamlet	10.5	11.0	9.5
This Above All	12.5	8.0	9.5
The Nigger of the Narcissus	7.0	22.0	12.0
Saratoga Trunk	12.5	15.0	13.5
Rebecca	8.5	22.0	13.5
Keys of the Kingdom	10.5	22.0	15.0
Life with Father	20.5	15.0	16.0
Baree, Son of Kazan	24.0	11.0	20.5
Boys' Life of Mark Twain	20.5	17.5	20.5
The Count of Monte Cristo	16.5	22.0	20.5
Dr. Jekyll and Mr. Hyde	16.5	22.0	20.5
Education for Death	16.5	22.0	20.5
For Whom the Bell Tolls	24.0	11.0	20.5
You Can't Do Business with Hitler	25.0	11.0	20.5
Boy on Horseback	16.5	22.0	20.5

differences only appear. The differences are not as marked as one might anticipate; thus, a number of popular modern novels appear in all grades. All these pupils read a somewhat more varied and mature assortment of books than did the pupils about whom Brink writes:

"With the exception of a few classics which were undoubtedly prescribed reading, the list of books most frequently read by seniors is made up largely of the best sellers of the year."[1]

Reading the newspaper is another pursuit that deeply influences the attitudes of pupils. A number of significant suggestions for helping pupils engage in this activity intelligently have been made in recently published volumes.[2] Several studies show

TABLE VII.—NUMBER AND PERCENTAGE OF HIGH-SCHOOL GIRLS AND BOYS THAT READ THE NEWSPAPERS REGULARLY
(Oak Park)

Name of Newspaper (Daily)	Girls		Boys		Both Sexes	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Chicago Daily News	166	68	170	71	336	70
Chicago Daily Tribune	154	63	157	65	311	64
Chicago Sun	50	20	52	21	102	21
Chicago Herald American	57	23	71	29	128	26
Daily Times	39	16	42	17	81	16
Christian Science Monitor	3	1.2	3	1.2	6	1.2
New York Times	0	0	2	0.8	2	0.4
Other papers not published in Metropolitan Chicago	3	1.2	5	2	8	1.6
Oak Leaves (a weekly paper of magazine type)	11	4.5	10	4	21	4.3

that the newspaper published in the local community is the one generally read. This study simply confirms other investigations in revealing the appeal of the local papers. (See Table VII.) The analysis of this activity divulged no significant variation from the pattern revealed by other studies.

The pupils were requested to indicate the number of times that they attended the motion picture theatre each week. The aver-

[1] Brink, William G.: "Reading Interests of High-school Pupils." *School Review*, Vol. XLVII, October, 1939, p. 618.

[2] *Cf.* Dale, Edgar: *How to Read a Newspaper.* Chicago: Scott, Foresman and Co., 1941.

age number is presented by grades in Table VIII. These boys and girls attend the cinema about once each week in every grade. They were requested to indicate their favorite movies. The preferred titles are set forth by grade in Table IX. There is little difference in the choices from grade to grade. The movie attended and liked appears to be the one which is being shown currently and locally. It is of interest that sex differences do not appear to be as pronounced in this area as in the field of books.

TABLE VIII.—MEAN NUMBER OF TIMES HIGH-SCHOOL STUDENTS ATTEND THE CINEMAS EACH WEEK
(Oak Park)

Grade	Mean Number of Cinema Attendances		
	Girls	Boys	Both Sexes
IX	.94	.97	.96
X	1.08	1.04	1.06
XI	1.12	1.44	1.28
XII	.81	1.06	.91
All Grades	.98	1.11	1.04

The amount of time spent daily in listening to the radio is about two hours. In the twelfth grade, slightly less time is given to this activity than in the other grades. (See Table X.) Boys and girls usually like the same programs, as Table XI reveals. *Bob Hope*, *Red Skelton*, and *Fibber McGee* have strong appeal in all grades. In fact, there is little change in their preferences during the four-year period of the high school. In order that this relative constancy may be revealed, Table XII is presented. In this table favorite radio programs are classified according to grades. The reader will recall that a similar constancy appeared from grade to grade in the lists of favorite books and movies.

This study is similar to others in revealing the general appeal of the comics, the radio, and the motion picture. In several respects, this investigation reveals a leisure pattern somewhat superior to that reported in certain other investigations. The

TABLE IX.—RANKING GIVEN BY GIRLS AND BOYS TO THE TWENTY-FIVE MOTION PICTURES GIVEN HIGHEST RANKING BY BOTH SEXES
(Oak Park)

Name of Motion Picture	Rank		
	Girls	Boys	Both Sexes
Corsican Brothers	2.0	1.0	1.0
Hellzapoppin	4.0	2.0	2.0
Son of Fury	3.0	3.0	3.0
Remember the Day	1.0	15.6	4.5
Sullivan's Travels	5.0	6.5	4.5
International Squadron	7.5	5.0	6.0
They Died with Their Boots On	12.0	4.0	7.0
To Be or Not to Be	6.0	8.5	8.0
Sergeant York	19.0	6.5	9.0
One Foot in Heaven	7.5	10.5	10.0
How Green Was My Valley	10.5	10.5	11.0
Bahama Passage	9.0	15.5	12.0
All Through the Night	15.5	8.5	13.0
H. M. Pulham, Esq	10.5	18.0	14.0
Dumbo	15.5	23.5	15.0
Jungle Book	15.5	13.5	16.5
A Yank in the R.A.F	25.0	12.0	16.5
Citizen Kane	40.0	23.5	19.5
Babes on Broadway	18.0	18.0	19.5
Louisiana Purchase	21.5	29.0	19.5
Play Mates	15.5	47.0	19.5
Blossoms in the Dust	13.0	20.5	22.5
Blondie Pictures	21.5	29.5	22.5
Blues in the Night	21.5	13.5	24.5
Sundown	51.0		24.5

pupils appear to read more and better books than other groups; and their selection of radio programs and motion pictures appears to be made somewhat more discriminatingly. Yet, when it is recalled that the comic books constitute a considerable share of

the magazines read and when one recalls that there is little change during the four years in the preferred books, movies and radio programs, one recognizes that the situation might be greatly improved. Moreover, certain studies should be undertaken to reveal the relationship of these activity patterns to the life adjustment of secondary-school pupils.

The motion picture, the radio, the newspaper and the comics have a strong universal appeal. This study does little more than to reveal the extent of the interests and to suggest the need for an intelligent study of these factors as they affect the behavior

TABLE X.—MEAN NUMBER OF HOURS HIGH-SCHOOL STUDENTS SPEND DAILY IN LISTENING TO RADIO PROGRAMS
(Oak Park)

Grade	Mean Number of Hours		
	Girls	Boys	Both Sexes
IX	2.03	1.72	1.86
X	2.33	1.91	2.09
XI	2.43	2.12	2.28
XII	1.70	1.80	1.74
All grades	2.09	1.88	1.98

and conduct of students. Nevertheless, the extent and nature of individual differences revealed in this study appear to warrant the following recommendation:

The first responsibility in guidance involves a careful study of each boy and girl to ascertain his reading pattern (in and out of school), his habits and reactions in radio listening, and in attending the motion picture. Such an appraisal could be made through the use of an interest inventory; undoubtedly such information would assist the teacher in understanding pupils' needs and possibilities. Guidance can not proceed far without an understanding of the way the pupil prefers to use his leisure.

A second responsibility involves these agencies as vehicles of general education. The problem here is one of making these avocational pursuits allies in an educational program that is designed to influence the child's behavior during his entire day.

TABLE XI.—RANKING GIVEN BY HIGH-SCHOOL GIRLS AND BOYS TO THE TWENTY-FIVE RADIO PROGRAMS GIVEN HIGHEST RANKING BY BOTH SEXES
(Oak Park)

Name of Radio Program	Rank		
	Girls	Boys	Both Sexes
Bob Hope	1.0	1.0	1.0
Red Skelton	2.0	2.0	2.0
Fibber McGee	4.0	3.0	3.0
Lux Radio Theatre	3.0	9.0	4.0
Kay Kyser	6.0	4.0	5.0
Henry Aldrich	5.0	6.0	6.0
Jack Benny	9.0	5.0	7.0
I Love a Mystery	13.0	7.0	8.0
Hit Parade	8.0	17.0	9.0
Glenn Miller	14.0	8.0	10.0
Information Please	7.0	23.5	11.0
Mr. District Attorney	11.5	11.5	12.0
Hermit's Cave	11.5	15.0	13.0
Ball Games	20.5	10.0	14.0
One Man's Family	10.0	23.5	15.0
Charley McCarthy	20.5	13.5	16.5
Spotlight Bands	17.0	16.0	16.5
Take It or Leave It	15.5	18.0	18.0
Quiz Kids	15.5	25.0	19.0
Blondie	18.5	19.5	20.5
News	18.5	11.5	20.5
Fred Allen	24.5	13.5	22.0
They Live Forever	22.0	19.5	23.0
Three Sheets to the Wind	23.0	21.5	24.0
New York Philharmonic	24.5	21.5	25.0

Many secondary schools have already inaugurated changes to attain this objective. Far too many schools, however, continue to ignore these agencies and simply deplore the tendency of

Table XII.—Favorite Radio Programs by Grades
(Oak Park)

Grade IX		Grade X		Grade XI		Grade XII	
Radio Program	Rank	Radio Program	Rank	Radio Program	Rank	Radio Program	Rank
Bob Hope	1.0	Bob Hope	1.0	Bob Hope	1.0	Bob Hope	1.0
Red Skelton	2.0	Red Skelton	2.0	Red Skelton	2.0	Red Skelton	2.0
Fibber McGee	3.0	Fibber McGee	3.0	Fibber McGee	3.0	Lux Radio Theater	3.0
Lux Radio Theater	4.0	Lux Radio Theater	4.0	Lux Radio Theater	4.0	Henry Aldrich	4.5
Kay Kyser	5.0	Kay Kyser	5.0	Kay Kyser	5.0	Jack Benny	4.5
Henry Aldrich	6.0	Jack Benny	6.0	Ball Games	6.0	Fibber McGee	6.0
I Love a Mystery	7.0	Henry Aldrich	7.0	Henry Aldrich	7.5	Information Please	7.0
Mr. District Attorney	8.0	I Love a Mystery	8.0	Hermit's Cave	7.5	Glenn Miller	8.0
Jack Benny	9.0	Hermit's Cave	9.0	Hit Parade	9.5	Hit Parade	9.5
Hit Parade	10.0	Glenn Miller	10.5	Spotlight Bands	9.5	One Man's Family	9.5
Charley McCarthy	11.5	Information Please	10.5	Mr. District Attorney	11.0	News	11.0
Information Please	11.5	Hit Parade	12.0	Glenn Miller	12.5	Kay Kyser	12.5
Blondie	13.0	Mr. District Attorney	14.0	Jack Benny	12.5	N. Y. Philharmonic	12.5
Hermit's Cave	15.5	Take It or Leave It	14.0	Charley McCarthy	14.0	I Love a Mystery	14.0
Quiz Kids	15.5	Ball Games	14.0	I Love a Mystery	15.5	Take It or Leave It	15.0
Three Sheets to the Wind	15.5	Quiz Kids	16.0	Fred Allen	15.5	Hermit's Cave	17.5
They Live Forever	15.5	Spotlight Bands	17.0	One Man's Family	17.5	Quiz Kids	17.5
Ball Games	19.0	Charley McCarthy	18.0	News	17.5	Fred Allen	17.5
One Man's Family	19.0	Blondie	20.0	Take It or Leave It	19.0	They Live Forever	17.5
Glenn Miller	19.0	One Man's Family	20.0	Information Please	20.5	Charlie McCarthy	21.0
Take It or Leave It	21.5	They Live Forever	20.0	Blondie	20.5	Spotlight Bands	21.0
Spotlight Bands	21.5	Fred Allen	22.0	Quiz Kids	22.0	Ball Games	21.0
Fred Allen	23.0	Three Sheets to the Wind	23.0	N. Y. Philharmonic	23.5	Blondie	24.0
News	24.0	News	24.5	Three Sheets to the Wind	23.5	Mr. District Attorney	24.0
		N. Y. Philharmonic	24.5		....	Three Sheets to the Wind	24.0

high-school pupils to find their satisfactions in shoddy or limited recreational pursuits. This paper makes it clear that boys and girls, even when they are enrolled in a superior high school, need counsel and direction in reading; and they need guidance in selecting, evaluating and interpreting programs to which they listen on the radio or see presented on the screen. In other words, the need is for an education program that will deeply affect the pupil's life design. This obligation is clearly indicated in the following passage:

"The true educational agency is the community within which and by means of which the individual comes to whatever maturity he reaches. . . . The problem of education is the problem of community-making, in the most fundamental sense of the term. . . . School is important. But an unrelated school—a school that is unacquainted with, or indifferent to, the world within which it is attempting to operate, the world from which its 'pupils' come each morning and to which they must go back evenings—is an impertinence. A school that compels children to become 'pupils' for some hours of each day is in the long run an immoral institution. The vitalities of life are in communities, not in institutions!"[1]

[1] Hart, Joseph K.: *Mind in Transition.* New York: Covici Friede, 1938.

THE VOCABULARY OF COMIC STRIPS

GEORGE E. HILL

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Analysis of the vocabulary of representative comic strips might seem to lack practical educational purposes. Yet, justification for a word count of comic strips is three-fold. First, every influence known to impinge upon the lives of children should be thoroughly studied, and studied in as many different ways as possible. To make constructive use of such an obviously interesting pastime as reading the comics we must know a great deal about the comics. Among other things, we should know what kind of vocabulary influence they may have upon children. A second justification lies in the value such word counts may have for those now producing material of the comic strip type that is intended to compete with the less desirable comics. A third justification may be found in the lack of word counts dealing with such familiar material as the newspaper. Fries and Traner[1] have pointed to this. "The word counts we have are deficient in the matter of colloquial English. . . . There are many common, necessary words that do not get into print, especially into the kind of publication that furnished the bulk of the material already counted. . . . The materials of drama, newspaper and magazine, catalogs like that of Sears, Roebuck and Co., may furnish a starting point."

Do the comic strips interest children? A word count is too laborious an affair to be engaged in upon material of doubtful appeal. There is ample evidence of the appeal of the comic strip and the comic book. Hill and Trent[2] have reported on the "comic" interests of children in grades IV, and V, and VI. Eisenberg,[3] Brown,[4] Lehman and Witty,[5] and more recently

[1] Fries, C. C. and Traner, A. A.: *English Word Lists.* Prepared for the Committee on Modern Languages of the American Council on Education. Washington, D. C.; American Council on Education, 1940. pp. 107.

[2] Hill, George E. and Trent, M. E.: "Children's Interests in Comic Strips." *Journal of Educational Research*, Vol. XXIV, Sept., 1940, pp. 30–36.

[3] Eisenberg, Azriel L.: *Children and Radio Programs.* New York: Columbia University Press, 1936, p. 81.

[4] Brown, Francis J.: *The Sociology of Childhood.* New York: Prentice-Hall, 1939, p. 343.

[5] Lehman, H. C. and Witty, P. A.: *The Psychology of Play.* New York:

Brumbaugh[1] have all thrown light on the interests of children in comic strips. These studies all agree on a point with which most parents and teachers are already familiar; namely, that children are, with few exceptions, intensely interested in comic strips. Reading them is a type of leisure activity in which they frequently engage, from which they retain a good deal of information, for which they profess great interest, and which they prefer to many other attractive leisure pursuits. Wilson[2] even found that the comics were commonly reported as a type of material which kindergarten and primary children use in their first attempts to learn to read.

Similarly, adolescent youth seems to have a decided preference for the comic strips. Studies such as those of Grumette,[3] Punke,[4] Center and Persons,[5] and Johnson[6] agree that young people like to read the comics.

RELATED STUDIES

A good deal has been said about the language of comic strips but there has been little actual study of comic-strip vocabulary. Attention has been centered upon the oddities of comic strip language. Gay[7] mentions the crudities of comic strip language and notes that the substitution of such marks as "***!!!XX" and the like for profanity "is one of the few instances where anything is left to the imagination of the reader."

A. S. Barnes, 1927, pp. 51–57.

[1] Brumbaugh, Florence N.: *Stimuli Which Cause Laughter in Children.* New York University, Unpublished Ph. D. Dissertation in Education, 1939.

[2] Wilson, Frank T.: "Reading Interests of Young Children." *The Journal of Genetic Psychology*, Vol. LVIII, June, 1941, pp. 363–389.

[3] Grumette, Jesse: "Investigation into the Newspaper Reading Tastes and Habits of High-school Students." *High Points*, Vol. XIX, December, 1937, pp. 5–10.

[4] Punke, Harold H.: "The Home and Adolescent Reading Interests." *School Review*, Vol. XLV, October, 1937, pp. 612–620.

[5] Center, S. S. and Persons, G. L.: *Survey of Reading in Typical High Schools of New York City.* Monograph No. 1, New York City Association of Teachers of English, New York: Noble and Noble, Inc., 1936, pp. 76.

[6] Johnson, B. L.: "Children's Reading Interests as Related to Sex and Grade in School." *School Review*, Vol. XL, April 1932, pp. 257–272.

[7] Gay, Roger C.: "A Teacher Reads the Comics." *Harvard Educational Review*, Vol. VII, March, 1937, pp. 198–209.

Lehman and Witty[1] have suggested reasons for reading the funnies, among the various reasons being, they opine, "Lack of restraint is demonstrated in the use of language, which is usually incorrect and indecorous. Such usage permits the character unrestrainted and uninhibited action in verbal situations." The commercial merits of simple language, when used in comic strips for advertising purposes, are brought out by Grumbine.[2]

Brumbaugh[3] has thrown some light on the vocabulary of comic strips and comic booklets. She found that children gave the fact that comic books were "easy to read" as a primary reason for liking them. The children she studied, when asked to draw funny pictures, drew pictures that resembled the comics and used language similar to that of the comics. These children used eighty-four different onomatopoeia in their drawings, most of these being the familiar arf, beep, bong, and the like of the comics. "The effect of the antics of the funny paper characters upon the behavior of children is as yet a mere conjecture, but there can be no doubt that the manipulated spelling and fantastic language used in the comic strips influences their written English."

That the interpretations children put upon cartoon material may be influenced by their understanding of the vocabulary of the cartoon is suggested by Shaffer.[4] In speaking of the curricular use of cartoons, Shaffer says that, "It is necessary, then, to supplement the cartoon with other curriculum materials which will correlate with it and with which it will correlate. The most obvious need is for vocabulary. Many of the errors in Cartoon 5 are due to a lack of understanding of 'usurpation.'" "Some of the errors in correctness (of interpretation) are due

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[1] Lehman, H. and Witty, P. A.: "The Compensatory Function of the Sunday Funny Paper." *Journal of Applied Psychology*, Vol. XXVII, June, 1927, pp. 202–211.

[2] Grumbine, E. E.: *Reaching Juvenile Markets.* New York: McGraw-Hill, 1938, p. 264.

[3] Brumbaugh, Florence N.: *Opus cit.*

Brumbaugh, Florence N.: "The Comics and Children's Vocabularies." *The Elementary English Review*, Vol. XVI, February, 1939, pp. 63–64.

[4] Shaffer, Laurance F.: *Children's Interpretations of Cartoons.* New York: Bureau of Publications, Teachers College, Columbia University, pp. 62 and 67.

to a lack of meaning or an incorrect meaning for elements of the drawing. This is especially true of word elements."

A recent study of the vocabulary of comic books[1] reveals that about ninety per cent of the words used in certain comic magazines appear in the Thorndike list and that the bulk of words used are standard words.

THE COMICS STUDIED

This study is concerned with the comic strips found in the daily papers and does not include the comics of the Sunday supplements or of the comic booklets. Sixteen comics were selected on the basis of their varying degree of interest to children as demonstrated by the study made by the writer and Miss Trent.[2] Four full weeks of these sixteen comics were sampled by picking the first week of February, May, August, and November for one year and securing the six daily strips for each comic for each week. In this way twenty-four strips were secured for each of the sixteen comics, three hundred eighty-four strips in all. The comics studied appeared in the five Philadelphia daily papers, two morning and three afternoon papers. They are listed below:

Blondie	Mickey Mouse
Bringing up Father (Jiggs)	Orphan Annie
Dick Tracy	Popeye (Thimble Theatre)
Dixie Dugan	Smilin' Jack
Gasoline Alley (Skeezix)	Tailspin Tommy
Hairbreadth Harry	Tarzan
Henry	Terry and the Pirates
Joe Palooka	Winnie Winkle

All words used in the comic strips were recorded. No attempt was made to record symbols such as **, !!!##, and the like, which, though very expressive of meaning in their proper context, would be difficult to translate into accurate or even printable language. All onomatopoeia, slang, and other various forms of manufactured "words" were recorded. There were, in all, 9302 different words and a total of 28,808 words altogether. The

[1] Thorndike, Robert L.: "Words and the Comics." *Journal of Experimental Education*, Vol. x, December, 1941, pp. 110–113.

[2] Hill, George E. and Trent, M. E.: *Opus cit.*

average comic strip studied, then, contained about twenty-five different words and seventy-five words altogether.

Classification of Words

A separate word count was kept for each of the sixteen comics and the words classified into the following groupings:

(*a*) Those that appeared in Gates Primary Word List.[1]

(*b*) Those that appear in Thorndike's Teacher's Word Book.[2] These words were classified as to their position in the list.

(*c*) Words found in standard dictionaries but not classified in the Thorndike or Gates lists.

(*d*) Slang. These words were not always easy to classify.

(*e*) Misspelled words.

(*f*) Onomatopoeia.

(*g*) Foreign words.

Table I presents a general numerical summary of the classification of the words found in all sixteen comics.

It is apparent that a large proportion of the words used in these comic strips are of the simpler, most used variety. Over three-fourths of all words used are found in Gates' Primary Word List and eighty-seven per cent are found in the first 5000 of Thorndike's list. While slang, onomatopoeia, and misspelled words seem, when one read the comics, to loom large in their vocabulary, they do not constitute a very heavy proportion of the total vocabulary of these sixteen comics.

VOCABULARY LOAD OF VARIOUS COMICS

The vocabularies of the various comics analysed vary considerably, both as to the numbers of words used and as to the nature of those words. It is probably not necessary to give the complete vocabulary of each comic; but comparisons will be made to indicate the general nature of variation among the various strips. Table II provides a general summary of these variations.

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[1] Gates, A. I.: *A Reading Vocabulary for the Primary Grades Revised and Enlarged*, New York: Bureau of Publications, Teachers College, Columbia University, 1935.

[2] Thorndike, E. L.: *Teacher's Word Book of* 20,000 *Words*, New York: Bureau of Publications, Teachers College, Columbia University, 1932.

TABLE I.—CLASSIFICATION OF WORDS IN SIXTEEN COMICS

Classification	Different Words		All Words	
	Number	Per Cent	Number	Per Cent
a. Words in Gates Primary list	5,590	58.6	22,480	78.0
b. Words in Thorndike list:				
1*a*	3,808	41.7	18,394	63.9
1*b*	1,339	14.6	2,453	8.5
2*a*	690	7.5	1,114	3.9
2*b*	489	5.2	911	3.1
3*a*	294	3.1	509	1.7
3*b*	312	3.3	464	1.6
4*a*	201	2.1	266	.9
4*b*	207	2.1	453	1.6
5*a*	150	1.5	323	1.1
5*b*	131	1.3	164	.6
6	216	2.2	347	1.2
7	124	1.4	166	.6
8	84	.9	98	.3
9	92	1.0	137	.5
10	85	.9	124	.4
11	79	.8	138	.5
12	57	.6	104	.4
13	67	.7	108	.4
14	38	.4	52	.2
15	23	.2	35	.1
16	13	.1	16	.1
17	29	.3	53	.2
18	35	.3	55	.2
19	20	.2	25	.1
20	30	.3	46	.1
c. Words not in the lists	204	2.2	687	2.4
d. Slang	130	1.4	294	1.0
e. Misspelled words	284	3.0	1,027	3.6
f. Onomatopoaeia	69	.7	233	.8
g. Foreign words	2	0	9	0
Total[1]	9,302	100.0	28,808	100.0

[1] Total exclusive of words in the Gates' Primary Word List.

TABLE II.—CLASSIFICATION OF WORDS USED IN THE VARIOUS COMICS

Comic	Total Number of Words		Percentages of Words of Various Sorts											
			Words in Gates		Words Not in Lists		Slang		Mis-spelled Words		Onomato-poaeia		Foreign Words	
	Diff.	All	Diff.	All	Diff.	All	Diff.	All	Diff.	All	Diff.	All	Diff.	All
1. Tarzan	1,137	4,078	51%	82%	3%	4%	.3%	.2%	....	.....	.1%	.02%		
2. Orphan Annie	718	2,639	60	81	2	1	2	1	2	2	1	1		
3. Winnie Winkle	598	2,144	70	87	.3	.01	1	.6	2	.8	.2	.4		
4. Mickey Mouse	658	2,050	57	68	2	3	2	1	7	12	1	1		
5. Smilin' Jack	657	1,906	61	77	2	3	1	1	6	6	1	1	.1	.4
6. Terry and Pirates	709	1,882	55	75	1	2	1	1	3	3	1	1		
7. Popeye	525	1,781	66	78	3	2	2	2	3	3	1	1		
8. Jiggs	570	1,769	65	81	3	2	1	1	2	3	1	.4		
9. Joe Palooka	612	1,727	54	67	2	2	2	1	16	12	1	1		
10. Dixie Dugan	552	1,712	64	81	1	2	1	.4	2	1	1	1		
11. Hairbreadth Harry	579	1,616	54	69	3	3	2	3	2	2	1	3		
12. Dick Tracy	524	1,586	65	82	1	1	2	2	.2	.3	.4	.2		
13. Gasoline Alley	475	1,477	72	85	2	1	1	.5	1	2	1	1		
14. Tailspin Tommy	495	1,305	56	69	4	4	1	1	1	1	.6	.5	.2	.01
15. Blondie	455	1,079	63	78	2	2	.4	.03	.6	.05				
16. Henry	38	57	58	60	5	1								
Total	9,302	28,808	60	78	2.2	2.4	1.4	1.0	3.0	3.6	.7	.8	.02	.03

If one leaves "Henry" out of the picture, there is still considerable variation among the comics in total vocabulary, both as to number of different words and total number of words used. Obviously, there is a strong tendency for the comics with the heaviest total use of words to employ the greatest number of different words. This may be expressed by a rank correlation of +.909. The use of slang, misspelled words, onomatopoeia, and foreign words is not heavy, considering the usual expectation of such words in comics. Only slightly more than five per cent of the different words used and five per cent of all words used, were of these sorts.

There was a decided tendency for those comics in which much slang was used, also to employ more of the others of the variations from normal word forms. Rank correlations (rho) among the three variable (*a*) per cent of all words that were onomatopoeia, (*b*) per cent of all words that were misspelled and (*c*) per cent of all words that were slang, are as follows:

$$\text{Rho } (a{:}b) = +.696 \qquad \text{Rho } (b{:}c) = +.560$$
$$\text{Rho } (a{:}c) = +.629$$

There was also a tendency for those comics with the heaviest total vocabulary to employ the most slang. The rank correlation between total number of words used and total number of slang words used was +.468. The rank correlation between number of different words used and number of different slang words used was +.533.

There is a tendency for the comics which employ the greatest total number of words to use slightly easier words than those which employ fewer total words. Rank correlations between the total words used and the percentages of these words found in the first five hundred of the Thorndike list and the percentage found in the Gates list are +.333 and +.302, respectively. On the other hand, the comics using the greatest number of different words, tended to use somewhat more difficult words. The rank correlations between the number of different words used and the percentage of these words in the first five hundred of Thorndikes, list and the percentage in the Gates list are −.611 and −.464, respectively. No doubt this difference in relationships is due to the tendency to repeat simpler words more frequently than difficult words.

MOST COMMON WORDS

There were two hundred different words used more than twenty times each in these comic strips. These words represent 2.6 per cent of the different words. They were used a total of 17,533 times. Thus 2.6 per cent of the words, the two hundred most common, accounted for sixty-one per cent of the total word usage. These two hundred most common words are:

a
about
again
ah
ain't
all
am
an
and
another
any
are
around
as
at
away
back
be
been
better
big (ger)(est)
boy
but
by
call (s)(led)
can
can't
car (s)
come (s)
could
course
day
dear
death
did
didn't
do
don't
door
down
escape (d)(s)
even
ever
feel
find
first
fly (ing)
for
friend
from
get (s)(ing)
girl (s)
give (s)(ing)
go
going
good
got
great (er)(est)
ha
had
hand (s)
happen (ed)(ing)
has
have (ing)
he
help (ed)(ing)
her (s)
here
he's
him
his
home
house (s)
how
I
I'd
if
I'll
I'm
in
into
is
it
it's
I've
just
keep (s)(ing)
knew
know (s)(ing)
last
leave (s)(ing)
let
like (s)
listen (ed)(ing)
little
long

look (s)(ed)(ing)
love (d)(s)
make (s)(ing)
man
me
mean
men
might
Miss
money
more
mother (s)
Mr.
Mrs.
much
must
my
need (s)(ing)
never
night
no
not
now
of
off
oh
old
on
one (s)
only
or
our
out
over
people
pilot (s)(ed)
place (s)(ed)
plane
put (ting)
remember (s)(ed)
right
said
say (s)
see (s)(ing)
she
should
show (ed)(n)
sir
so
some
soon
still
sure
take (ing)
talk (ed)(ing)
tell (s)(ing)
than
thank (s)
that
that's
the
their
them
then
there
there's
these
they
thing (s)
think (s)(ing)
this
those
time
to
too
try (ed)(ing)
two
up
us
use (d)(ing)
wait (s)(ing)(ed)
want (s)(ed)
was
way (s)
we
well
we'll
were
we're
what
when
where
who
why
will (ed)(ing)
with
won't
work (s)(ing)(ed)
would
yes
you
your
you're
you've

That the comic strips major in action, more than in words, is suggested by the fact that only ten per cent of the words are nouns. The rest are verbs, adverbs, adjectives, pronouns, and the like. The heavy weighting of pronouns suggests the

extent to which the comics deal in person-to-person and person-to-group activities.

Of these two hundred most common words one hundred ninety-two are in the Gates Primary Word List, one hundred fifty-nine of them in the first five hundred, twenty-five in the second five hundred, seven in the third five hundred, and one in the fourth five hundred. One hundred sixty-seven are in the first five hundred of the Thorndike list.

SUMMARY

(1) Sixteen comics appearing in the daily papers were sampled for four one-week periods, for the six week days. All the words were counted in these twenty-four samples of sixteen strips. The comics selected were those known to be of varying degrees of popularity among fourth-, fifth-, and sixth-grade children.

(2) The words were classified according to their appearance in the Gates Primary and Thorndike word lists. There were 9302 different words and 28,808 words in all.

(3) The vocabulary of the comics is simple. Seventy-eight per cent of all words used appear in the Gates list. Nearly eighty per cent appear in the first two thousand of the Thorndike list.

(4) The use of slang, misspelled words, onomatopoeia and foreign words accounts for only slightly more than five per cent of all words used.

(5) The vocabulary load of comics varies considerably. Vocabulary load when measured by total words used is positively correlated with ease of words. Vocabulary load when measured by different words used is negatively correlated with ease of words. The correlation coefficients, however, are not large.

(6) A relatively small number of "action" and "person" words comprise the major part of the vocabulary of these comic strips.

(7) A comparison of the findings of this study with those of Thorndike[1] would suggest that the vocabulary of daily comic strips is somewhat simpler than that of comic magazines. Both studies report a relatively light use of slang, etc.

[1] Thorndike, R. L.: *Opus cit.*

THE RELATIVE STABILITY OF SOCIAL, INTELLECTUAL, AND ACADEMIC STATUS IN GRADES II TO IV, AND THE INTER-RELATIONSHIPS BETWEEN THESE VARIOUS FORMS OF GROWTH

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One of the important problems in educational psychology is the degree to which people are characterized by constancy as opposed to variability in respect to various attainments. Probably the greatest amount of research and controversy has centered around the problem of the constancy of the IQ. Although some data in this discussion bear on the IQ controversy, it is not the primary purpose of this report to make a contribution in the intelligence-testing field, but rather to present data bearing on the relative constancy of four kinds of measurements in child development, *i.e.*, of general social acceptance, of mutual friendships, of intellectual brightness, and of academic achievement, and to show the inter-relationships between these various forms of growth.

The data to be presented were gathered from children in the second, third and fourth grades in three schools in Denton, Texas, during the years from the Fall of 1939 to May, 1942. One of the schools utilized is the Demonstration School affiliated with the North Texas State Teachers College; the other two are public elementary schools. Throughout this report these schools are referred to as schools *A*, *B*, and *C*—*A* being the Demonstration School. Denton is a town of approximately twelve thousand population, located in the agricultural region of northern Texas.

The first point to make clear is how the several measurements were obtained. The scores for general social acceptance and for mutual friendships were determined in each grade by pupil choices. The kinds of situations utilized for this purpose in the second and third grades have been described in detail elsewhere.[2] Briefly stated, the situations in these grades included the choosing of companions for having a picture taken, the giving of Christmas presents, the giving of Valentines, selecting a seating companion, choosing a partner for a trip, sketching friends in an art class, giving Easter cards, designating ones preferred as

companions to go home with after school, selecting partners for a party, and voting for a class honor or office. The number of choosing situations utilized in each grade varied from five to eight, with the most usual number being six. These choosings were distributed throughout the second and third grades approximately one month apart.

In the fourth grade the choosing situations were as follows:

School *A*

October: choosing ones preferred as working companions on committees which were to be appointed for the semester.

December: listing names of those to whom they would like to give Christmas presents.

February: listing names of those to whom Valentines were to be given, in order that the teacher would know how many sheets of colored paper to give to each child for making the Valentines.

March: names of three friends were written on rating sheets which were then used to rate the friends on twenty personal traits.

April: selecting companions for making an arithmetic chart, and for working on a sign reading project.

May: listing the names of all best friends throughout the school year, as well as the names of all the best leaders in the room during the school year.

School *B*

November: listing the names of all children who would be selected to remain in the room if all others had to leave.

December: designating names of those to whom presents were to be given, as well as names of those to whom presents would be given if it were possible to do so.

February 10: voting on the king and queen for a Valentine party.

February 14: determining the number of Valentines each child received. This was done by taking the Valentines out of the box and counting the number for each child before they were distributed to the children.

March: same as for School *A*.

May: same as for School *A* for both friends and leaders.

School *C*

November: voting for officers in a class club.

December: same as for November, with all officers available for re-election.

February: same as in Schools *A* and *B*.

March: same as in Schools *A* and *B*.

April: election of club officers.

May: voting on the "best citizen" in the room for the school year. (Considerable emphasis had been given to citizenship and five or six votings had been held throughout the year on the "best citizen.")

May: same as for Schools *A* and *B* for both friends and leaders.

In nearly all of the above situations there was no limit placed on the number of choices which could be made. This technique provides a more adequate measure of each child's social acceptance than is possible when choices are limited to only one, two, or three names. All the choosing situations were conducted by the classroom teachers.

In order to state both general social acceptance and mutual friendships in numerical terms the following system of scoring was used: first choise—5 points, second—4 points, third—3 points, fourth—2 points, fifth—1 point, and all other choices—1 point. (This point system was not used in the situation involving the giving of Valentines, since no order of choice was indicated. Each Valentine received counted two points.) The composite social status score for each child was determined by converting his raw score in each choosing situation into a per cent, adding all his per cent scores, and then obtaining an average for each child. These average per cent scores for the entire year constituted the data used in running the correlations given under general social acceptance in Table I and Table II. The procedure used in obtaining these average per cent scores may be made clearer by the use of an illustration. Suppose a child by the name of Mary received in a given choosing situation one first-place choice, two second-place choices, and one third-place choice. This would make a vote of $5 + 8 + 3$, or a total of 16. After each child's score was obtained in the above manner, the grand total for the entire class was determined. Then

each child's score was converted to a per cent. Thus Mary's final rating in a particular choosing situation was based on the proportion she received of all the votes cast. At the end of a school year these per cent scores for each child for all choosing situations were added. Now, again, a child's per cent of this total was obtained. Thus Mary's rating for the entire year in social acceptance was a composite of all the proportional representations she had received in all voting situations during the nine months of school. It would seem that the rating received from this procedure would be a very valid index to each child's social status.

The mutual friendship scores were obtained by a further differentiation of the data used in arriving at general social status. This was done by establishing three degrees of mutual attraction and two degrees of unreciprocated friendships. These were called "very mutual," "moderately mutual," and "weakly mutual" friendships, and "largely" and "very" unreciprocated friendships. These degrees of mutual attraction and rejection were determined by the extent to which two particular children voted for each other throughout the school year. The point of reference was the maximum score which one child would give another if he voted for him in first place in every choosing situation during the year. Thus in School *A* in the fourth grade there were eight choosing situations which would make possible a maximum score of 40, since each first place vote counted five points. The standard set up for a "very mutual" friendship was that each child gave the other one a total score vote during the year equal to, or greater than, forty per cent of the maximum possible score. The standard for a "moderately mutual" attraction was thirty per cent of the maximum score, and that set up for a "weakly mutual" friendship was twenty per cent of the maximum. A slight leeway of one or two points on either side of the exact figure was allowed in some cases.

The "largely unreciprocated" group was composed of those combinations of pupils in which one gave the other one a total score vote approximately equal to the standard for moderately mutual and received in return a total vote which was less than the standard for weakly mutual. The "very unreciprocated" group was made up (in the second and third grades) of those

combinations of pupils in which one gave the other one a total score vote equal to, or greater than, the standard for a very mutual friendship and received in return a total vote which was less than the standard for weakly mutual. In the fourth grade a child was not considered "very unreciprocated" unless he gave a total vote greater than that required for a very mutual attachment and received less than the standard for weakly mutual. This change was made to insure greater validity for the classification of "very unreciprocated." Although these standards for unreciprocation were adhered to in nearly all cases, some exceptions were made. For instance, one girl gave another one a total of 23 and received in return a score of 8. Since the latter figure is a little higher than the standard for "weakly mutual" (which was 7 in her school) the girl receiving it did not technically belong in the "very unreciprocated" class, but she was put in it because of the extreme difference in scores. There were only four or five cases like this one in which it seemed advisable to depart slightly from the standards set up.

Since the same percentage basis was used for the various degrees of attractions or rejections in all three schools, it was possible to combine all the results even though a different number of choosing situations was utilized in the several schools.

In as much as the data in respect to the validity of the various classifications of mutual and unreciprocated friendships on the second and third grade level are very similar to those for the fourth grade, and have been described in a previous publication,[2] only the results for the latter grade will be given here. When the results for the three fourth grades were thrown together, it was found that the very mutual friends gave each other an average score vote for the year of 21 points, the moderately mutuals gave each other an average vote of 13 points, and the weakly mutuals gave each other an average vote of 9 points. Those who were "largely unreciprocated" gave an average vote of 11 to those whose friendship they sought, but received in return only an average of 1. The "very unreciprocated" gave an average of 18 points to those to whom they were attracted, but received in return only an average of 2. These figures would seem to justify the statement that the various groups were well differentiated on the basis of different degrees of attraction and rejection.

It is not within the province of this discussion to consider findings related to the different degrees of mutual and unreciprocated friendships. The only concern is with the total mutual friendship scores which were derived from these different degrees of attraction and rejection. The total mutual friendship scores were obtained in the following manner: each very mutual friendship was given a count of 3, each moderately mutual a count of 2, each weakly mutual a count of 1, each largely unreciprocated relationship a count of -1, and each very unreciprocated relationship a count of -2. The algebraic sum of these points made up the total mutual friendship scores. Thus a child with one very mutual friendship, one moderately mutual friendship, and one largely unreciprocated relationship would have a score of $3 + 2 - 1 = 4$. The scores obtained in this manner constitute the total mutual friendship data used in running the correlation coefficients reported in Tables I and II.

The IQ's reported upon in Tables I and II were based on the California Mental Maturity Test in the second grade and on the Kuhlman-Anderson Test in the third and fourth grades. Intervals of five IQ points were used in calculating the coefficients.

Academic achievement in the grades studied was based on the Gates Silent Reading Test in the second grade, and on the Stanford Achievement Test in the third and fourth grades. The scores used in running the correlations were decimal fractions which represented the extent to which a child had attained the grade norm at the time a test was given. Thus, when the Stanford Achievement Test was given on March 25 in the third grade the normal grade placement was 3.7. This number was divided into each child's grade placement on the test. It was necessary to do this in order to run the correlations between successive grade levels, and also because the tests were not always given at the same time in the three schools.

Before considering the implications of the data reported in Table I, it should be pointed out that with very few exceptions exactly the same subjects were used in running the correlations between successive grade levels in all four measurements. This increases the validity of the comparative degrees of constancy. Also, it can be observed from the probable errors given in Table I that all the coefficients have complete statistical reliability.

TABLE I.—CORRELATION COEFFICIENTS SHOWING THE DEGREE OF CONSTANCY BETWEEN SUCCESSIVE GRADE LEVELS IN SOCIAL SUCCESS, INTELLIGENCE, AND ACADEMIC ACHIEVEMENT IN THREE DENTON SCHOOLS

Social Acceptance				Mutual Friendships	
2nd and 3rd, All Schools	3rd and 4th, Schools			2nd and 3rd, All Schools	3rd and 4th, All Schools
	A	*B*	*C*		
Cases, 48	Cases			Cases, 51	Cases, 37
	17	17	12		
.84 ± .02	.90 ± .02	.68 ± .08	.69 ± .10	.41 ± .08	.49 ± .09

Intelligence				Academic Achievement			
2nd and 3rd, All Schools	3rd and 4th, Schools			2nd and 3rd, All Schools	3rd and 4th, Schools		
	A	*B*	*C*		*A*	*B*	*C*
Cases, 48	Cases			Cases, 45	Cases		
	17	17	12		17	13	12
.76 ± .04	.93 ± .02	.71 ± .08	.78 ± .07	.60 ± .06	.87 ± .04	.77 ± .07	.82 ± .06

Turning now to the interpretation of the data in Table I, it can be observed, first, that all the correlations, with the exception of those for mutual friendships, are quite high. The lower relationships found for mutual friendships are undoubtedly due to the greater discrimination involved in mutual attractions. It is more difficult for a child to continue to receive reciprocations from the children to whom he is also attracted than to maintain general social acceptance irrespective of who gives the choices.

The correlations on general social acceptance show greater stability for this measurement between the second and third grades than for both intelligence and academic achievement. The comparative figures are .84 for social acceptance and .76 and .60 for the other two measures. This finding emphasizes the constancy of social status. Between the third and fourth grades the coefficient for general social acceptance in School *A* was very high (.90), and the correlations for the other two schools were close to seventy (.68 and .69). This shows a good degree of constancy, but not quite as much as was found for both intelligence and academic achievement between the same grade levels. In School *A* the coefficient for intelligence was above ninety, and in both the other schools the relationship fell in the seventies. Two of the correlations for academic attainment between the third and fourth grades were above eighty and the third one was only a few points lower (.77). These latter figures are in line with the results of many other studies which have shown a high degree of constancy in measures of intelligence and school achievement. The relatively lower correlation between the second and third grades in academic success is probably explained by the fact that in the second grade only reading ability was measured, whereas in the third and fourth grades the total grade placement on the Stanford Achievement Test was used.

It is interesting to note that the highest degree of stability in all three measurements between the third and fourth grades was found in School *A*. The smaller amount of pupil turn-over per year in the Demonstration School as compared with the two public schools is probably the chief explanation for this difference. Of course, only pupils who were present in both grades were used in the correlations, but when as much as thirty per cent of old pupils leave a grade and new ones come in, there

is a considerable redistribution of social status in the permanent population.

A summary interpretation of the data in Table I leads to the conclusion that with the subjects studied, and presumably with others under similar conditions, a child's social position from grade to grade in the elementary school is approximately as constant as is his position in degree of brightness and academic achievement. This would not be nearly as true, however, with mutual friendships as with general social acceptance.

It is not within the range of this discussion to consider the reasons why general social success was found to be approximately as constant as the IQ's and academic success. This would lead into a consideration of the rôle of the constancy of hereditary factors, personal traits, teaching procedures, and home backgrounds, in producing the approximate constancy of all forms of attainment—including popularity, intellectual brightness and academic achievement. It is within the limits of this discussion, however, to consider the question of relationships between the four kinds of measurements reported in Table I. Are those who are most successful socially also the ones who are superior in intelligence and in the school subjects? Do intellectual brightness and academic success offer a good guarantee of the acquisition of social skills? The data in Table II bear on these questions.

The significant findings which emerge from Table II may be summarized as follows: the highest relationship was found between general social acceptance and mutual friendships; the next highest was found between intelligence and academic achievement; the least amount of relationship—and it should be considered low—was between both general social acceptance and mutual friendships on the one hand and intelligence and academic achievement on the other.

The relatively high correlations shown in Table II between general social acceptance and mutual friendships are not surprising, since the scores for both measurements were drawn from the same data. However, the fact that the coefficients are far from perfect shows that there are some children who are high in one of these social measurements without being high in the other. With a few exceptions, the differences in positions on these two measurements were due to some pupils having a higher

TABLE II.—CORRELATION COEFFICIENTS SHOWING RELATIONSHIPS BETWEEN MEASURES OF SOCIAL, INTELLECTUAL, AND ACADEMIC GROWTH IN THE SECOND, THIRD, AND FOURTH GRADES IN THREE DENTON SCHOOLS

Second Grade—All Schools

Social Acceptance and Mutual Friends	Social Acceptance and IQ's	Social Acceptance and Reading	Mutual Friends and IQ's	Mutual Friends and Reading	IQ's and Reading
$N = 56$	$N = 48$	$N = 47$	$N = 52$	$N = 55$	$N = 56$
.71	.32	.25	.19	.42	.48

Third Grade—All Schools

Social Acceptance and Mutual Friends	Social Acceptance and IQ's	Social Acceptance and Stan. Ach.	Mutual Friends and IQ's	Mutual Friends and Stan. Ach.	IQ's and Stan. Ach.
$N = 61$	$N = 48$	$N = 46$	$N = 61$	$N = 59$	$N = 46$
.69	.34	.31	.34	.32	.62

Fourth Grade—All Schools

Social Acceptance and Mutual Friends	Social Acceptance and IQ's	Social Acceptance and Stan. Ach.	Mutual Friends and IQ's	Mutual Friends and Stan. Ach.	IQ's and Stan. Ach.
$N = 77$	$N = 81$	$N = 78$	$N = 78$	$N = 76$	$N = 78$
.66	.31	.36	.20	.26	.60

mutual friendship score than general acceptance score. Such children confined their voting largely to those whom they knew reciprocated their friendship. It might be wondered how any child could be very high in general social acceptance without also being high in the mutual friendship measurement. This is possible because a child may receive a large number of votes in different choosing situations throughout a year and yet not receive a high frequency of choices from those whom he most consistently votes for.

Turning now to the column on the extreme right in Table II, it can be observed that the correlations between academic success and IQ's are a little lower than those which have generally been reported from similar studies. Why this is so is not revealed by the data available. The coefficient of .48 found on the second-grade level is particularly low. Those reported for the third- and fourth-grade levels (.62 and .60) are more representative, but still not as high as might be expected.

The most significant data presented in Table II are those showing the consistently low correlations between the two measures of social success on the one hand, and the measurements of intelligence and academic achievement on the other. The coefficients range from .19 to .42, with half of them being in the low thirties, and four of the twelve falling below thirty. These findings must be interpreted to mean that, although there is a small tendency for those who are superior in intelligence and academic achievement also to be superior socially, this tendency is definitely small. Therefore, it cannot be assumed that social success will be a natural consequence of intellectual brightness and academic achievement. Social skills, as well as arithmetic, must be taught. The school which is desirous of educating the whole child must make as definite provisions for the promotion of social acceptance and mutual friendships as for the development of physical and intellectual abilities. This point needs particular emphasis at the present time, since it is evident from various educational journals that some schoolmen, under the pressure of war needs, are saying that what the school needs to concentrate on is the "fundamentals." Usually, those who say this mean that the child's time in school should be spent almost entirely on drilling in reading, writing, and arithmetic to the exclusion of time spent on the creative arts and on group activ-

ities designed to promote social development. This is certainly a narrow view of the kind of education needed to prepare children for the problems of the post-war world. It would seem to be only a matter of common sense judgment that the need of individuals who are skilled in the arts of inter-personal relationships and group leadership will be greater than ever in the years ahead of us. Although some individuals achieve eminence in those skills without any consciously directed education, we cannot afford to leave so vital a matter to chance; particularly since we know that social adequacy and group leadership ability are not a natural consequence of attainments in other lines of endeavor.

The low correlations reported in Table II between the measures of social success and the measures of intelligence and academic achievement have some bearing on the validity of the classification of 'social intelligence,' which Thorndike and other psychologists have used as being parallel with 'abstract' and 'mechanical' intelligence. Obviously there is much overlapping in all such classifications; but, in as much as the correlations between the measures of social success and the measures of 'abstract' abilities were consistently low, the data could be considered as supporting the idea of a 'social intelligence' factor, or a syndrone of social traits. Of course, it could not be asserted that what is called 'social intelligence' is as closely related to hereditary factors as has generally been claimed for abstract intelligence or mechanical aptitude. It must be admitted, however, that very little is known about the relation between constitutional factors and social traits.

The foregoing emphasis on the low correlations between the social and intellectual measurements should not obscure the fact that all the correlations between the two measures of social success and the measures of intelligence and academic achievement were positive, and that none of them were even close to being zero. This bears out the general psychological finding that all desirable traits are positively correlated to some degree. Irving Lorge emphasizes the significance of this point when he says: "if psychologists are responsible for one generalization, it is that all positive traits are correlated positively."* This

* The Thirty-Ninth Yearbook of the National Society for the Study of Education, *Intelligence: Its Nature and Nurture*, Part 1, p. 281.

means that, in spite of the syndrones of social and intellectual traits previously discussed, the general picture is one in which good intellectual and social traits are associated together, and, also, in which poor intellectual and social traits are likewise associated together. When extreme groups in respect to social success are compared with regard to their status in the intellectual abilities, this point becomes more emphatic. Table III shows the contrast between the upper and the lower one-fourth in general social acceptance in the three grade levels in respect to intelligence and academic achievement.

TABLE III.—COMPARISON OF AVERAGES OF THE UPPER AND THE LOWER ONE-FOURTH OF CHILDREN IN THREE DENTON SCHOOLS IN GENERAL SOCIAL ACCEPTANCE ON THE BASIS OF INTELLIGENCE AND ACADEMIC ACHIEVEMENT

Social Acceptance Levels*	2nd Grade		3rd Grade		4th Grade	
	IQ Ave.	Reading Grade Level	IQ Ave.	Stan. Ach. Grade Level	IQ Ave.	Stan. Ach. Grade Level
Upper fourth.....	107	3.4	111	4.0	114	5.5
Lower fourth.....	92	2.8	97	3.2	101	4.2

*In each fourth for the three years there were approximately twenty cases.

Examination of Table III reveals that the upper fourth in social acceptance was superior to the lower fourth on all three grade levels in both intelligence and academic attainment. This consistency, together with the degree of the differences, is certainly convincing evidence that the most popular children, as a group, were outstanding over the least popular ones in the intellectual abilities measured. It is interesting to note that the differences between the average IQ's of the upper and lower groups is almost exactly the same over the three years—being 15, 14, and 13 points, respectively. It is also interesting to note that the superiority of the upper group over the lower in academic achievement becomes progressively greater over the three years. Between the successive grade levels the differences

run .6, .8, and 1.3. This result could mean that social success becomes more of a factor in subject-matter achievement over the several years, or it could mean the opposite—that academic attainment becomes more important to social acceptance. Probably there is a reciprocal relation between those two influences. Regardless of which is the stronger influence over the other, the data in Table III support the view that all desirable traits are associated. It also emphasizes the point that high popularity in the elementary school is more likely to be accorded to those children who are bright, and who succeed well in their school work, than to those of opposite characteristics. It must not be forgotten, however, that when the entire group is considered the correlations are low.

SUMMARY

Scores on general social acceptance and mutual friendships were obtained from pupil choices over three grade levels in three schools in Denton, Texas. Group intelligence tests were also given each year, as well as measures of academic achievement. Correlations were run between the scores of successive grade levels in these four measurements. All the coefficients were quite high, with the exception of those for mutual friendships. The results were interpreted as showing that general social acceptance was approximately as constant over the three years as were IQ's and academic attainment.

Correlations were obtained between the four measurements on each grade level. The highest relationship was found between general social acceptance and mutual friendships; next highest between intelligence and academic attainment; and least between both intelligence and academic achievement on the one hand, and the measures of social success on the other. The latter relationship was interpreted as meaning that the attainment of social skills cannot be assumed to be a natural consequence of intellectual brightness or the mastery of subject-matter. Social growth must be provided for as definitely as any other kind of development. The data on this low relationships between the social and intellectual measurements were related to the concept of 'social intelligence.'

The fact that all the correlations between the measures of social success, on the one hand, and the measures of intelligence

and subject-matter, on the other, were positive, was cited in support of the psychological generalization that all desirable traits are positively correlated. This point was further emphasized when the upper fourth in popularity was compared with the lowest fourth in popularity in respect to both IQ's and academic achievement. All comparisons definitely favored the upper group.

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THE EFFECT OF FAMILIARITY WITH AN OCCUPATIONAL FIELD ON A RECOGNITION TEST OF VOCATIONAL INTEREST

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Methods of measuring interest have ranged from free association, attention, and information techniques, on the one hand, to inventories of likes and dislikes, on the other. The results of these varying attempts at interest measurement were reviewed in detail by Fryer in 1931,[5] and more recently by Super[13] and Super and Roper.[14] As pointed out by these and by other writers, the inventory or questionnaire has for a score of years been the principal technique for those carrying on research or counseling in the field of interests.

More recently, however, there has been an increased interest in the development of more objective measures of interest. Thus the Coöperative Test Service has published a general information test[3] and Greene[7] a vocabulary test, both scored for information, *i.e.*, interest in fields such as science, art, and sports; and the senior author and his students have for several years experimented with memory tests of interest in nursing,[9,14] clerical work,[11] the metal trades,[2] and in occupational fields at and above the skilled-trades level.[8] The underlying assumption in each case is that those who are most interested in an activity retain most information concerning it.

The method used in these latter studies consists of projecting, onto a screen, pictures of persons engaging in the activities of the occupation or occupations in which interest is to be assessed, and then giving a test for recognition of relevant material seen in the pictures. In the first studies,[9,11,14] no warning was given of the test which was to follow the pictures, in subsequent investigations subjects were told that the test would follow.[2,8] The items in the recognition test deal with material seen in the pictures and, in so far as possible, depend on memory for what was seen in the pictures rather than on previous information. In the Vocational Interest Test developed by Super and Older and described in detail by Older,[8] this was achieved by having all test items involve marking whether or not a given scene or object had appeared in the pictures.

PROBLEM

Of crucial importance to the validity of such a technique is the assumption that immediate memory for such material is not affected by earlier experience; assumption which seems contradicted by the evidence of most previous experimentation. If the meaningfulness of material results in improved retention of that material, as Ebbinghaus' experiments[4] with nonsense and meaningful material first proved, and as Gordon,[6] Achilles,[1] Seelman[10] and numerous others have since shown, then it might be expected that those who are familiar with an occupation would remember more such pictures or items in pictures, when tested as in the Vocational Interest Test, than they would of pictures dealing with less familiar activities. The most familiar might be expected to have the most meaning. This would to some extent invalidate the technique of the Super-Older Test, which attempts to measure interest as revealed by immediate memory, for those taking the test take it with a background of differing occupational contacts. Insofar as previous familiarity with an occupation is the result of interest, these differences would increase the predictive value of the test even though partly invalidating the basic hypothesis. But since familiarity with an occupation is in many cases the result of factors other than interest (*e.g.*, parental and sibling occupations, financial necessity), the question of whether meaning and familiarity are identical, and of the effect of the latter on this test technique, becomes crucial. Seelman's work shows that attitudes influence the meaning of a content and hence the focusing of attention, suggesting that meaningfulness and degree of familiarity may not be synonymous.

The purpose of this study was, therefore, to determine the effect of previously acquired information on recent memory, as measured by the Super-Older Vocational Interest Test.

METHOD

The method consists of administering the Super-Older Test of Vocational Interest (described below), together with tests of intelligence (for control purposes), occupational vocabulary (for familiarity), and preferences (for expressed interest). The last three were, respectively, the Otis Q.S. Mental Ability Test,

the Michigan Vocabulary Profile Test (modified), and the Strong Vocational Interest Blank. The modification of the Michigan Test consisted of omitting the Mathematics and Fine Arts sections, and of substituting Trades and Literature sections taken from the O'Rourke Mechanical Aptitude Test (Pt. 2) and several standard vocabulary tests, respectively. It is recognized that this test provides, not a measure of the daily occupational vocabulary of any job, but rather a gauge of familiarity with the vocabulary which is basic to a given occupational field. This latter seems more adequate as a measure of vocational interest at the pre-occupational level than would the former, for the daily-job vocabulary is more restricted both as to range and as to availability to the as-yet-unemployed; that this lessens slightly the degree of relationship which might be expected to exist between the Michigan and Super-Older Tests seems probable but not crucial. The subjects were one hundred thirty-five high-school students, enrolled in academic and trade courses. They constituted most of the junior and senior boys in two small town high schools in central Massachusetts.

The Vocational Interest Test consists of two film strips of sixty frames of pictures of occupational activities. Each part, or film strip, contains three sections. Each section consists of twenty pictures dealing with a given occupational field or family. The grouping is based on research by Thurstone[15] and Strong.[12] These fields are as follows:

Scientific Professions	Clerical Occupations
Social Service Professions	Selling Occupations
Literary and Legal Professions	Skilled Trades

The test is preceded by a brief statement of the nature of the film strips and of the memory test to follow. Each frame is exposed for seven and one-half seconds, the whole series requiring about seventeen minutes. The recognition test has no time limit, but rapid work is urged and most students finish in twenty minutes. Half of the items or pictures described in the recognition test are shown in the pictures, and half are not, there being two hundred forty items all told, forty questions per occupational field.

All tests were administered either during school time or to volunteers only, and were preceded by an explanation of the

value of the standard test scores to the boys themselves in vocational planning. The fact that one test (the Super-Older) was not a standard test was not made clear, for the sake of motivation.

RESULTS

As the occupational classifications used in the three vocational tests are not identical, it was necessary to combine certain groups to obtain comparability. The Sales and Clerical sections of the Super-Older Test were averaged for comparison with the Commerce section of the Michigan Test. The Government and Literature sections of the modified Michigan Test were averaged for comparison with the Literary and Legal scores of the other two tests (Strong's Blank was scored by means of his Keys for broad occupational fields).

Correlations between corresponding parts of the three interest tests, and between two interest tests with intelligence partialled out, are shown in Table I.

TABLE I.—CORRELATIONS BETWEEN MEMORY, INFORMATION, INTEREST, AND INTELLIGENCE TESTS

Occupational Field	Super-Older, Michigan	Super-Older, Strong	Michigan, Strong	Super-Older, Otis	Michigan, Otis	Super-Older, Michigan, Otis Constant
Scientific.....	.07	.14	.30	−.23	.50	.22
Social Service	.04	.12	.22	.07	.56	.00
Literary and Legal.....	.12	−.02	.08	.22	.49	.01
Commercial..	.13	.05	−.24	−.03	.58	.18
Skilled.....	.11	.18	.12	.01	.39	.12

The first column of figures in Table I shows that there is no relationship between occupational vocabulary, or familiarity with an occupational field as measured by the Michigan Vocabulary Profile Test, and immediate memory, as measured by the Super-Older Vocational Interest Test. That this lack of relationship is not the result of intelligence is seen in the last column,

which shows that partialling out intelligence has no appreciable effect on the coefficients. That intelligence is related to familiarity or vocabulary scores as shown in column five, is to be expected; that it plays a very minor part in immediate memory is perhaps surprising although in line with an earlier investigation.[14] The correlation between total memory score and intelligence is only .27.

As the Michigan, Strong, and Super-Older Tests all purport to measure vocational interests, a comparison of the first three columns is of interest. It has already been pointed out that there is no relationship between the Michigan and Super-Older Tests. Similarly, there is no relationship between the Strong and Super-Older Tests, and little or no relationship between the Michigan and Strong Tests.

DISCUSSION

We have seen that the Super-Older Test is not a measure of familiarity with or information about occupations, and that it is not a measure of the similarity of a person's interests to those of people engaged in a given occupational field.

The former finding supports the fundamental assumption of the Super-Older Test; namely, that immediate memory is not necessarily a reflection of mere experience or familiarity. The familiar, as Seelman's work suggests, may or may not be meaningful. It is now clear that when material to be remembered is more or less familiar to all, the degree of familiarity has no effect on memory. The authors seem to have been successful, in constructing the Vocational Interest Test, in selecting items which are at least moderately familiar to high-school boys. Differences in the retention of material seen in the pictures, therefore, do not depend on differences in apperceptive mass. The test has also been shown not to be a measure of intelligence. The meaningfulness of the picture content to the individual depends, therefore, on the extent to which it challenges his interest. We may conclude that interest in an occupational activity may derive from that activity or its representation regardless of the degree of familiarity with that occupation, given enough familiarity for recognition to be possible.

That immediate memory for pictures of occupational activities is unaffected by the degree of similarity of interests to those of

persons engaged in those occupations, seems to conflict with established theories concerning the retention of meaningful material, especially as just applied to the data of this investigation. In other studies,[2,8,9,11,14] however, evidence has been reported which led to the conclusion that being interested in an occupation is not necessarily synonymous with having interests like those of people engaged in that occupation. (This evidence consisted of the low correlations of memory tests and interest inventories, such as those reported here; of the low correlations of memory tests with intelligence tests; and of the differentiating value of the memory tests which indicated that these were measuring something related to occupational choice. As the nature of the test suggests that this something is interest in the activities pictured, it was concluded that being interested in an occupation is not the same as having likes and dislikes similar to those of workers in that occupation.) The conclusion, therefore, seems warranted that, granted a minimum of familiarity, meaningfulness (which in this instance means interest and which manifests itself as the focusing of attention on pictures) is not affected by degree of familiarity with the activities portrayed.

SUMMARY

This study attempts to determine the effect of familiarity with an occupational field upon scores on a test of interest involving immediate recognition of pictures of occupational activities. This test (the Super-Older Vocational Interest Test), a test of basic occupational vocabulary (parts of the Michigan Vocabulary and O'Rourke's Mechanical Aptitude Test), Strong's Vocational Interest Inventory, and the Otis QS Test were administered to one hundred and thirty-five high school boys.

The conclusions were:

(1) Granted moderate familiarity with the occupational fields in question (that typical of high-school juniors and seniors), the degree of familiarity with an occupational field has no effect on memory of simple picture material dealing with that field.

(2) As intelligence also plays a negligible part in the retention of material such as the above, it is concluded that memory scores are a reflection of the focusing of the attention of the individual on objects and activities which challenge his interest.

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FINDING THE BEST METHOD FOR MEMORIZING

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Memorizing is not an exact science, but a fairly reliable estimate can be made of the amount of effort which will be required for memorizing selections of poetry or prose by various methods.

The experience of one hundred fifty students at Mills College and the University of California who memorized several thousand lines from Milton's *Paradise Lost* is summarized in Table I in the form of index numbers. This table is designed to indicate the relative number of readings required for memorizing passages ranging in length from five to four hundred lines when the learning is either massed or distributed. In massed learning the passage is read over and over at one sitting until it is mastered. In distributed learning the intervals between study periods range from one hour to eight days, and the number of readings at each period may be one, two, three, or four.

No one examining Table I will be surprised to note that the values in the columns increase in going from the bottom to the top. In other words, the longer the passage the greater the number of readings needed for memorizing it. Not all, however, will be prepared to find the values in the rows decreasing from left to right as the length of the intervals between readings increases. If two selections are learned under similar conditions except that one is read once every hour until memorized and the other is read once every eight days until learned, the first will require about three times as many readings as the second.

The utility of the table is greatly increased when the index numbers represent absolute instead of relative values. Knowing the base value—the number of readings needed for memorizing one line by single readings spaced eight days apart—one can multiply this by the appropriate index number and find the actual number of readings which will most probably be needed for any combination of length of selection and length of interval between study periods. The base value can be found by dividing the index number for any combination by the number of readings necessary for learning it.

An application of the index numbers is given in Table II. A college student memorized several twenty-line selections from

TABLE I.—INDEX NUMBERS OF READINGS NEEDED FOR MEMORIZING SELECTIONS OF POETRY OR PROSE[1]

Lines	Readings at each period	Number of hours between study periods									
		0	1	2	4	8	12	24	48	96	192
400	1		17.05	14.55	12.50	10.86	10.11	8.55	7.36	6.36	5.68
300	1		15.68	13.41	11.57	9.89	9.50	7.80	6.48	5.80	5.23
200	1		13.91	11.82	10.23	8.80	8.18	6.93	5.77	5.23	4.64
100	1		11.25	9.66	8.32	7.20	6.70	5.75	4.77	4.25	3.75
50	1	10.91	8.82	7.66	6.66	5.80	5.34	4.66	4.05	3.50	3.07
45	1	10.68	8.55	7.43	6.45	5.61	5.18	4.50	3.93	3.39	2.98
40	1	10.23	8.25	7.18	6.25	5.43	5.00	4.25	3.80	3.27	2.86
35	1	9.77	7.93	6.91	5.00	5.23	4.82	4.18	3.64	3.16	2.75
30	1	9.54	7.57	6.59	5.73	5.00	4.59	4.00	3.48	3.02	2.64
25	4		10.32	9.39	8.84	7.86	7.50	6.93	6.43		
25	3		9.27	8.34	7.80	6.82	6.45	5.89	5.39		
25	2		8.23	7.30	6.75	5.77	5.41	4.84	4.23		
25	1	9.09	7.18	6.25	5.70	4.73	4.36	3.80	3.30	2.86	2.50
20	1	8.41	6.73	5.86	5.09	4.43	4.09	3.55	3.09	2.68	2.34
15	4		8.84	8.05	7.34	6.73	6.41	5.93	5.50		
15	3		7.95	7.16	6.45	5.84	5.52	5.05	4.61		
15	2		7.07	6.27	5.57	4.95	4.64	4.16	3.73		
15	1	7.73	6.18	5.39	4.68	4.07	3.75	3.27	2.84	2.45	2.14
10	1	6.82	5.50	4.77	4.16	3.61	3.34	2.91	2.52	2.18	1.91
5	4		6.43	5.86	5.36	4.93	4.77	4.32	4.02		
5	3		5.80	5.20	4.70	4.27	4.11	3.66	3.36		
5	2		5.14	4.55	4.05	3.61	3.45	3.00	2.70		
5	1	5.68	4.48	3.89	3.39	2.95	2.73	2.34	2.05	1.77	1.54
4	1		4.36	3.75	3.23	2.80	2.61	2.14	1.86	1.66	1.45
3	1		3.95	3.41	2.95	2.57	2.39	2.02	1.80	1.52	1.32
2	1		3.55	3.05	2.61	2.27	2.11	1.82	1.57	1.34	1.18
1	1		3.00	2.57	2.18	1.89	1.75	1.55	1.25	1.09	1.00[2]

[1] Some of the data used in preparing this table were published in *The American Journal of Psychology*, Vol. LIII, No. 3, July, 1940, pp. 423–427, under the title "Distribution of effort in memorizing prose and poetry."

[2] 1.00 equals number of readings needed for memorizing one line by readings spaced eight days apart.

Dante's *Inferno* and found the average number of readings needed was 8.41. The index number for twenty-line passages with zero interval between readings is 14.8. When 14.8 is divided by 8.41, the quotient is 1.76. This means that 1.76 readings would be necessary for memorizing one line by readings spaced eight days apart. Then the readings necessary for any number of lines with any given interval between readings could be found by multiplying 1.76 by the index number for that particular combination. In this case the average rate of reading was about twenty-one lines a minute. By using this information and multiplying the index numbers by the base value of 1.76 it would be possible to approximate the number of readings necessary for any combination of length of selection and length of intervals. One could estimate also the number of minutes required for study and the number of days which would elapse between the beginning and the end of the memorizing. Typical computations are given in Table II.

To explain the procedure in Table II, suppose the student decided to memorize a two hundred-line poem by repeated readings of the whole poem. The index number for two hundred-line passages when the interval between single readings is one hour is 13.91. 13.91 times 1.76, the base value, equals twenty-four, indicating that twenty-four readings would be needed. Thus he would read four thousand eight hundred lines, and his reading rate being twenty-one lines a minute about two hundred twenty-nine minutes would be needed for the memorizing. If he read the poem eight times a day, the elapsed-time would be three days. If single readings were spaced two days apart, the study-time would be reduced from two hundred twenty-nine minutes to ninety-five minutes, but the elapsed-time would be increased from three days to twenty days. For intervals of eight days the study-time would be seventy-seven minutes, and the elapsed-time would be sixty-four days.

The one-hour interval is not necessarily superior to the eight-day interval because the elapsed-time is three days as against sixty-four days; the eight-day interval is not necessarily superior to the one-hour interval because the study-time is only seventy-seven minutes as against two hundred twenty-nine minutes. If the student were lying in bed waiting for broken bones to knit, probably the one-hour interval would be chosen as the best

method. If he spent an hour twice a day on trains or street-cars, he might prefer the twenty-four-hour or forty-eight-hour intervals. Other circumstances might make seven-day or eight-day intervals the best method.

TABLE II.—ESTIMATION OF TIME NEEDED FOR MEMORIZING SELECTIONS OF VARIOUS LENGTHS BY VARIOUS METHODS

(1) Length of Selection to Be Learned, Lines	(2) Length of Intervals between Readings, Hours	(3) Index Numbers, from Table I	(4) Number of Readings, (3) × 1.76	(5) Number of Lines Read, (1) × (4)	(6) Minutes of Study-time, (5) ÷ 21	(7) Days of Elapsed-time, (4) × (2) days
25	0	9.09	17	425	20	1
25	1	7.18	13	325	15	2
25	48	3.30	6	150	7	12
25	96	2.86	5	125	6	20
25	192	2.50	4	100	5	32
50	0	10.91	19	950	45	1
50	1	8.82	16	800	38	2
50	48	4.05	8	400	19	16
50	96	3.50	6	300	14	24
50	192	3.07	5	250	12	40
200	1	13.91	24	4800	229	3
200	48	5.77	10	2000	95	20
200	96	5.23	9	1800	86	36
200	192	4.64	8	1600	77	64

To carry the computations in Table II still farther, suppose the student considered dividing the two hundred-line selection into four parts of fifty lines each to be learned completely before beginning work on the next. The study-time and elapsed-time for fifty-line passages would be multiplied by four. For forty eight-hour intervals, for instance, the study-time would be

seventy-six minutes, and the elapsed-time would be sixty-four days.

The elapsed-time might be reduced if the parts were learned concurrently rather than consecutively. Say the first part was to be read once on the morning of a certain day and the second that same evening. The third and fourth parts would be read, respectively, on the morning and evening of the next day. This schedule would be repeated until the selection was committed to memory. By this method the study-time would be approximately seventy-six minutes, and the elapsed-time would be sixteen days.

It cannot be emphasized too strongly that no system of learning is superior under all circumstances. There is a best method for any given situation, and this should be selected only after one has made the best possible estimate of the time and effort required for memorizing by various methods.

NOTE ON A NEW THEORY ABOUT VISUAL FUNCTIONING AND READING DISABILITIES

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Many investigators have studied visual defects as possible causes of poor reading habits and skills, but, despite the growth of the interactionist point of view in psychology, little or no investigation has been made of poor reading habits and skills as possible causes of certain visual defects. Since the days of Javal, psychologists have studied the functioning of the eyes. Such investigators as Betts;[1] Blake and Dearborn;[2] Eames;[3] Farris;[4] Gates and Bennett;[5] Imus, Rothney and Bear;[6] Johnston;[7] Stromberg;[8] Swanson and Tiffin;[9] Wagner;[10] Witty and Kopel;[11] and others have variously found from negligible to

[1] Betts, E. A.: *The Prevention and Correction of Reading Difficulties.* Chicago, Row, Peterson Company, 1936.

[2] Blake, M. B., and Dearborn, W. F.: "The Improving of Reading Habits," *Journal of Higher Education*, Vol. VI, 1935, pp. 83–88.

[3] Eames, T. H.: "Low Fusion Convergence as a Factor in Reading Disability," *American Journal of Opthalmology*, Vol. XVII, August, 1934.

[4] Farris, L. P.: "Visual Defects as Factors Influencing Achievement in Reading," *California Journal of Secondary Education*, Vol. X, October, 1934, pp. 50–51.

[5] Gates, A. I., and Bennett, C. C.: *Reversal Tendencies in Reading.* New York: Bureau of Publications, Teachers College, Columbia University, 1935.

[6] Imus, H. A., Rothney, J. W. M., and Bear, R. M.: *An Evaluation of Visual Factors in Reading.* Hanover, N. H.: Dartmouth College Publications, 1938.

[7] Johnson, P. W.: *The Relation of Certain Anomalies of Vision and Lateral Dominance to Reading*, Monographs of the Society for Research in Child Development, Vol. 8, No. 2. Washington, D. C.: The Society, National Research Council, 1942.

[8] Stromberg, E. L.: "Relationship of Measures of Visual Acuity and Ametropia to Reading Speed," *Journal of Applied Psychology*, Vol. XXII, February, 1938, pp. 170–178.

[9] Swanson, D. E., and Tiffin, J.: "Betts' Physiological Approach to the Analysis of Reading Difficulties as Applied to the College Level," *Journal of Educational Research*, Vol. XXIX, February, 1936, pp. 433–438.

[10] Wagner, J. M.: "The Maturation of Certain Visual Functions and the Relationship Between These Functions and Success in Reading and Arithmetic," *Psychological Monographs*, Vol. XLVIII, No. 3, 1937, pp. 108–146.

[11] Witty, P. A., and Kopel, D.: "Factors Associated with the Etiology of Reading Disability," *Journal of Educational Research*, Vol. XXIX, February, 1936, pp. 449–459.

overwhelming support for the idea that certain eye conditions cause poor reading. Spache[1] has recently attempted a summary of fifty such studies of physical and functional difficulties as possible causes of poor reading habits and skills. This present note, on the contrary, aims to suggest the possibility of studying poor reading habits as a possible cause of certain visual defects. In other words, earlier researches have been concerned with a one-way causal connection; it seems just possible that the interaction between visual defects and poor reading should be given more emphasis in educational research. Ineffective skills and habits of reading may be causes of functional visual defects.

This theory of interaction between defects and reading habits has apparently grown up in some optometric groups, until it now forms the basis of many optometrists' practices in the adjustment of visual difficulties. The literature on the theory seems scattered and uneven in quality. While the newer approach must be regarded, at best, then, as a theory, it may be that educational psychology has been afflicted with some of the conservatism of orthodox ophthalmology in its failure to study, from a fresh angle, the whole problem of relations between reading abilities and visual defects. Certainly, educational psychology should attempt some experimentation to prove or disprove the various parts of the theory.

The different phases of the theory that poor reading may cause visual difficulties affecting reading seem to be stated by various writers under some five headings:

(1) *The Eyes Should Be Studied in Action.*—The eyes should be considered as functioning organs, not just "cameras." Too much emphasis in the past has been given to such items as length of the eyeball and not enough to the eyes working together. The use of such tests as the Snellen Chart tells practically nothing about visual difficulties. It is common knowledge that individuals can have their refractive errors determined, be given lenses that are mechanically correct for overcoming their difficulty, and yet they remain uncomfortable in visual work. Investigators now want to know what happens when fatigue becomes a factor in school or elsewhere as the eyes are at work.

[1] Spache, G.: "Rôle of Visual Defects in Spelling and Reading Disabilities," *American Journal of Orthopsychiatry*, Vol. x, April, 1940, pp. 229–238.

(2) *Many Visual Dysfunctions Are Something a Person Learns.* With the exception of astigmatism (which rarely presents correction difficulties) and some traumatic or pathological conditions, such as paralytic or paretic squint, visual difficulties are at least partly functional in character. For example, strabismus, a condition where vision is defective, usually in one eye, usually arises where the person's two eyes cannot work comfortably together, so he has adjusted by suppressing and perhaps suspending the vision in one eye. The individual sacrifices the benefits of binocular vision in the interest of comfortable vision in one eye and the offending eye grows out of line because in that way it is certain not to interfere. Similarly, although amblyopia usually has a physical basis, there is a possibility that it may be partly functional in character.

As a second example, myopia may be learned, although a tendency toward it may be hereditary. According to this theory, myopia is a habit a child may acquire in the interest of comfortable and efficient vision at close work; it is, in some cases, an adaptation to the needs of the school. In the development of desirable near-work patterns, clear distance vision is sacrificed. This difficulty is easily caught in the usual school examination, glasses are prescribed which help distance vision, but in so doing the near work vision is disturbed. (When a child of good academic standing wears glasses at close work which give him clear vision in the distance, his academic work sometimes suffers.) In some cases, with the new difficulty at the near distance, a new, comfortable pattern is again set up for near distance work, again destroying clear distance vision. Thus, a "progressive myope" may be produced. If myopia at the present time increases six hundred per cent between the first and fifth grades,[1] it would seem that the problem needs considerable study from a fresh angle. Similarly, it may be possible that hyperopia and other difficulties, usually studied only on a physical basis by ophthalmologists, sometimes are actually learned. The theory of "too long" or "too short" eyes, proposed by Helmholtz, a physicist, is probably no longer tenable as a complete explanation of the functioning of the eyes.

[1] This figure needs verification. It is given by: Ash, R. F.: "A Discussion of Some New Thinking Relative to Vision as a Function," *Journal of the American Optometric Association*, February, 1942, p. 11.

(3) *Correction of Visual Difficulties May Be Attempted on the Basis of Four Main Types of Difficulty Rather Than on Exact Dioptic Correction.*[1]—It has been suggested above that a great deal of the time and energy of oculists and others has been devoted to the measurement of refractive errors and the correction of these by the use of suitable lenses and prisms. The value of some of this work is questionable in that many people, given an exact correction, still cannot use their eyes comfortably; because this is true, oculists and others developed the practice of under-correcting hyperopia and astigmatism. In a practical sense, mechanically exact correction doesn't work. Instead, people with visual difficulties should be placed in one of four types and be given glasses which will not disturb their type. These types are:

(*A*) A toxic type—difficulties due to such causes as infection and drugs. This is not so numerous a type as once supposed; some writers put it at only ten per cent of the persons with visual defects.

(*B*) A type of low resistance to accommodative fatigue, divided into two classes: (B_1) a lower threshold of fatigue tolerance of the autonomic nervous system controlling accommodation, than of the somatic nervous system supplying adduction, causing an interference in the visual reflex; (B_2) a low threshold of fatigue tolerance in accommodation plus a pattern of special aptitude at far-point.

(*C*) a type of convergence insufficiency in which fatigue of the controls of convergence is prevalent.

The use of these four types implies the necessity of giving a complete analytical examination to the child or adult. The meaning of the types becomes clearer in the fourth point below.

(4) *Visual Difficulties Are Caused by Fatigue, Usually a Result of Interference between Accommodation and Convergence.*—Visual fatigue is difficult to measure, especially in younger children. It may, of course, be pathological, but there is also the possibility that it is produced in adjustments between accommodation and convergence. Accommodation or focussing is an involuntary

[1] This theory and some practice based on it seems much less tenable to the present writer than the other four possibilities here mentioned. It is included simply because it is advanced by one group of optometrists. It is not accepted by many reputable optometrists.

reflex controlled by the autonomic nervous system; convergence or adduction is a learned reaction under the control of the voluntary (somatic) nervous system. The two, functioning together, are usually called the "visual reflex." The child learns to focus with his particular eyes, "long," "short," or "normal," and learns to bring his two eyes to bear upon a given object much like he learns to use his fingers or his legs. Thus the use of the eyes involves both main parts of the nervous system; one school of optometric theory is based on the hypothesis that these systems, the autonomic and the somatic, have different levels of "fatigue-tolerance." For example, the typical B_1 type, mentioned above, is an individual with a lower threshold of "fatigue-tolerance" of the autonomic nervous system supplying accommodation, than of the somatic nervous system adduction, bringing about an interference in the visual reflex. The corrective procedure, then, is to find some pathway to inhibit more accommodation without inhibiting more adduction and without interfering with desirable existing habits.

Accommodation and convergence, then, must always work together for comfortable vision. A child cannot focus the eyes at one point and converge them to another point nearer or farther away without having visual difficulties such as discomfort, blurring, and double vision. It is in these cases that active orthoptical procedures may be used.

(5) *Many Factors Must Be Considered in the Improvement of Visual Functioning.*—It is usually not enough merely to prescribe a prism, lens, or occluder as a "correction" for the visual difficulty. Visual functioning involves posture, illumination, fatigue, and many other factors. The correction of a disability, then, may involve a change in physical habits, attention to the hygiene of the eyes, emphasis on posture, checking on illumination standards, frequent changes of fixation, and more outdoor play. Orthoptic training, under competent medical guidance, should be included among other possibilities for treatment. A complete case history is important as a supplement to the results of the usual visual examination.

The above five suggestions must be regarded as very tentative conclusions underlying the main hypothesis that visual disabilities and poor reading exist not in a cause-and-effect relationship but as interacting factors. Some of the suggestions, such as the

third, may be proved inadequate without necessarily affecting the validity of the other suggestions.

Evidence grows that visual functioning is more liable to change than anatomical factors alone could make possible. In addition to examples given above, it is accepted that there is a general development from the hyperopia of infancy to the approximate emmetropia of the adult; accommodation ability rises from very little in infancy to a peak somewhere about ten years of age; men refused by the army draft board because of color blindness are being retrained and make acceptable soldiers. There is a possibility that certain conditions affect the size of the blind spot. If it can be reduced by exercise, reading ability might be increased. The effects of much reading in bed or considerable reading practice with tremendous emphasis upon speed need to be investigated. Obviously, reading is a central process as well as a peripheral one, but some writers believe that there are superior functioning eyes. If so, what are their characteristics and histories? Tinker[1] attempted to discover the relationship between speed of convergence and divergence and speed of reading. He found a correlation of .27, but his methods were admittedly uncertain and he attributes no significance to the result. The problem needs further investigation along the lines suggested here. A study reported by Davis[2] on visual functioning and beginning reading should be extended. Educational research, especially in such fields as reading, spelling, and health, needs to explore some of the hypotheses connected with the theory that visual defects and poor reading skills and habits exist in interacting relationships.

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[1] Tinker, M. A.: "Motor Efficiency of the Eye as a Factor in Reading," *Journal of Educational Psychology*, Vol. XXIX, March, 1938, pp. 167–174.

[2] Davis, L. F.: "Visual Difficulties and Reading Disabilities" in *Recent Trends in Reading* (W. S. Gray, ed.). Supplementary Educational Monographs No. 49, November, 1939. Chicago: University of Chicago Press, pp. 135–143.

COMPARISONS OF RATINGS OF VOICE AND TEACHING ABILITY

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Many and varied generalizations have been made about the relation between a teacher's speech and his teaching needs and abilities. Some research has been carried out on the problem. A notable example is that of Wagner,[1] which points out, among other things, that "excellence or inadequacy in speech tended to influence ratings of teaching success." Many questions remain unanswered. This study considers three of them:

(1) How does voice rating compare with predicted teaching ability, as judged by a person's grade in practice-teaching?

(2) How does voice rating compare with teaching ability as rated by the supervising official under whom the person is teaching?

(3) How does the rating of voice by the training-school teacher compare with the rating of voice by the supervising school official?

PROCEDURE

A number of information files in the Iowa State Teachers College Placement Bureau[2] were selected at random and examined. These files were for teachers who were or had been registered with the bureau. They were not limited to any particular teaching level. Among other things in this file are:

(1) A rating of the student's voice by the supervisor of practice-teaching.

(2) The practice-teaching grade.

(3) A rating of the person's voice by the supervising official under whom he has taught.

(4) A rating of the person's teaching ability by the supervising official indicated by a rating of twenty-six items including such

[1] Wagner, Loretta: *A Diagnosis of the Speech Needs and Abilities of Prospective Teachers.* University of Iowa Studies in Education, Vol. x, No. 5, March 1, 1939.

[2] The author wishes to express his appreciation to Dr. E. W. Goetch, Director of the Placement Bureau, for making these materials available and to Dr. J. B. Paul, Director of the Bureau of Research, for assisting in the compilation of the results of this study.

things as Knowledge of Subject-matter, Coöperation and Loyalty, Interest in School Activities, Discipline, Sincerity, and Initiative.

The ratings on voice were on a scale from *A* to *E*. They were correlated on a 4 by 4 table, since no one was given a rating of *E* (Item 1).

Teaching ability ratings were on the following basis: *A*, *A*−, *B*+, *B*, *B*−, *C*+, *C*, *C*−, *D*+, *D*, *D*−, *F*. The lowest public school rating was *C*−; the lowest training-school grade was *D*. The training-school practice-teaching grade was correlated with teaching ability as rated in the public school (Item 2). Voice rating in the training school was correlated with teaching ability in the public school (Item 3). Voice rating in the public school was correlated with the practice-teaching grade (Item 4). Voice and teaching ability in the training school (Item 5) and voice and teaching ability in the public school (Item 6) were also correlated.

The results are presented in Table I.

TABLE I.—COMPARISONS OF RATINGS IN VOICE AND TEACHING ABILITY

	CASES	*C*	PE C	No. of PE's C is Removed from .0	DESCRIPTION OF TABLES
1. Voice as rated by the public schools and the training school.	433	.20	.03	6.7	4 × 4
2. Teaching ability as rated by the public school and the training school.....	435	.34	.03	11.3	8 × 9
3. Teaching ability as rated by the public school and voice as rated in the training school.....	433	.20	.03	6.7	4 × 8
4. Teaching ability as rated by the training school and voice as rated in the public school.....	432	.27	.03	9.0	4 × 10
5. Teaching ability and voice as rated in the training school.....	434	.62	.03	20.67	4 × 10
6. Teaching ability and voice as rated in the public school.....	580	.58	.028	20.71	4 × 8

OBSERVATIONS

The correlation between supervising critics' ratings of teachers' voices and the rating of these same teachers' voices by public school supervisors, though positive, is rather low (.20 ± .03). These results warn us that "voice" is a word which may include different things for different people; they seem to point to a need for the development of more objective and analytical method of voice evaluation.

The correlation between teaching ability as judged by supervising critics and public school supervisors, while positive, is also rather low (.34 ± .03). These results warn us also that "teaching ability" is a phrase which may mean different things to different people; they point to the need for the development of more objective and analytical methods of evaluating teaching ability.

There is a much higher correlation between teaching ability and voice when both are evaluated by either the supervising critics (.62 ± .03) or the public school supervisors (.58 ± .03). This relatively high correlation may be partly the result of a "halo" effect, *i.e.*, a tendency to be influenced in one's rating of a teacher's voice by one's estimation of that person's ability to teach and *vice versa*.

BOOK REVIEWS

E. C. Molina. *Poisson's Exponential Binomial Limit.* New York: Van Nostrand and Co., 1942, pp. 47.

A variate has the Poisson distribution if the probability of its taking the value x is $a^x e^{-a}/x!$ for $x = 0, 1, 2, \ldots$. This distribution arises as the limit of the binomial distribution when the number of trials increases and at the same time the probability of "success" at each trial diminishes in such a way that the product, which is the expectation of the number of successes, is constantly equal to a. Applications of this distribution are very numerous. The most famous are Bortkiewicz's study of Prussian soldiers killed by horse-kicks and Student's study of the errors of counting with a haemocytometer, together with the work of Ethel M. Elderton in Volume X of *Biometrika*.

The Poisson distribution is related to the chi-square distribution in two ways: one of the derivations of the latter distribution uses the former; and the chi-square probability integral may be evaluated by repeated integration by parts which yields a series of terms constituting a partial sum of a Poisson series. There are other interesting theoretical relations of the Poisson distribution in mathematical statistics. For example, the sum of two or more independent Poisson variates is itself distributed in a Poisson distribution for which the parameter a is the sum of the values of this parameter for the constituents. This reproductive property may easily be proved by means of the characteristic function, which has a particularly simple form for the Poisson distribution. All the cumulants of a distribution are equal if and only if the distribution is of Poisson form. The parameter a of a Poisson distribution supplies a simple example for which a sufficient statistic exists, and this example is a very useful one in making clear to students the difference between efficient and inefficient statistics. Thus the Poisson distribution may well play an important part near the beginning of a course in statistics in illustrating the sort of criterion that should play a fundamental part in the choice of "measures of central tendency" and other descriptive statistics.

In psychological research the Poisson distribution has not played a large part. However, it is used effectively in the recent

work of Selig Hecht on the threshold of vision, and other applications of this kind will doubtless be made.

Mr. Molina's publication gives individual terms of the Poisson series in Table I and the cumulated sums of these for successive values of x in Table II. The parameter a is assigned values varying by steps of .001 from .001 to .010; then by steps of .01 up to 15; then by steps of 1 up to 100. These tables have been computed in the Bell Telephone Laboratories over a period of years, originally for use in switching problems, but latterly acquiring great importance in connection with sampling inspection schemes. Harold F. Dodge contributes a foreword.

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ROSE ZELIGS. *Glimpses Into Child Life.* New York: William Morrow and Co., 1942, pp. 442.

Because she believes that the age of parents makes it difficult for them to "see into" their youngsters' problems, and because, too, of her conviction that parents rarely have an opportunity to compare their children with others of the same age, Miss Zeligs reports in this book some inferences based on her studies of the twelve-year-old youngsters she has been teaching in the public schools of Cincinnati. Her material is divided into five sections: the first dealing with the child and his home, the second with the child and his school, the third with the child and his social world, the fourth with the child as an individual, and the fifth with all the tests that were given to the children and their parents in order to get data for the book. Miss Zeligs certainly went to primary sources for her materials in that practically all of the facts and most of the generalizations were derived from responses that children made to direct questions. The population she studied has been a neglected one.

The reviewer, being not only a psychologist but also the father of a twelve-year-old boy, reacted ambivalently to the book. From the point of view of a typical, naive parent, Dr. Zelig gives many fine common-sense hints about dealing with children. For example:

"If your child worries habitually, you had better take a look at yourself. Are you calm, contented and uncomplaining?

Are you annoyed by little things so that your brows are always puckered up, making an eternal frown on your face? Do you unconsciously express your fears and constantly warn your child to be careful about one thing or another? Children imitate worrying parents. Gay and happy parents instill their spirit into their children." (p. 69)

Inasmuch as the book is written primarily for parents, the above judgment should probably be the more significant one. As a psychologist, however, the reviewer found many things lacking. The author has an extraordinary faith in the verity of the answers children give to all sorts of intimate, 'direct' questions. No data were reported which had been derived from indirect, projective measuring techniques. The treatment of research data and sources was unusually casual. Had the author consistently used no footnotes or references to other studies, the reviewer would not be disposed to be critical, but when this is done in one chapter only (Chapter 15), the question arises immediately as to why none of the other thirty-five were similarly buttressed. Dr. Zelig's concept of the laws of learning is disturbing. She in one place called 'listening' a law of learning, (the *first!*), and in another (p. 113) "having a regular place to work alone in." Careless references were made to eminent educators and their work. E. L. Thorndike's instincts, for example, (p. 4) were amazingly telescoped and John Dewey was called the founder of all things Progressive. (p. 83)

Dr. Zeligs includes in part five of the book approximately forty-five different test, measuring attitudes toward home and family, toward school activities, toward health habits, toward food, as well as tests measuring the intelligence of parental treatment of younger and older children and their (the parents) respect for property. No discussion is given of the way these tests were constructed nor the accuracy with which they measure what they purport to measure. Only the average scores for the various populations are reported. No indications of variability are given. The reviewer's conclusion is that while the tests are numerous, it is impossible for anyone to criticize their merit because of a complete lack of evidence.

With respect to style, the writing seemed nervous and the author's rhetorical questions (Discipline—what harm and injury has been committed in thy name! p. 90) will seem patronizing to

many intelligent parents. At times the text was directed at fathers and mothers exclusively, with frequent use of the personal pronoun 'you' and at other times the admonitions were directed to everybody with the use of the first person plural. No attempt was made to have the chapter titles parallel, which is needlessly confusing. Some chapters were headed very simply with words such as "The Timid Child," whereas others were questions—"Do Children Fear Their Parents?," and others imperative like, "Stop Annoying Your Child."

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MAURICE M. SMITH, L. L. STANDLEY, AND CECIL L. HUGHES. *Junior High School Education.* New York: McGraw-Hill Book Co., 1942, pp. 470.

This volume on the junior high school includes: a brief history of junior-high-school education, some description of the junior-high-school child and the guidance practices appropriate to him, an analysis of the program of studies, and a concluding section on junior-high-school administration. These various sections give the impression of being but slightly related. Implications of the facts of adolescent growth and development for guidance are not sufficiently elaborated. Similarly, the discussion of guidance is apart from and unrelated to recommendations regarding the program of studies. The problems of administration are not viewed primarily as growing out of the facts of child development and the demands of a program of study. Consequently, the reader gets the impression that the authors' thinking about various aspects of the junior high school has not been adequately integrated.

The sections on development (physical, mental and emotional) and guidance will be of most interest to psychologists. The physical growth facts presented are of fairly recent vintage, but there are almost no data describing the growth of particular individual children and no reference is made to Stolz's recent studies of the growth of pre-adolescents. Despite several paragraphs entitled "educational implications," the reviewer felt the authors had neglected the 'meaning' of growth to teachers and adolescents as well as the effects of growth upon the adjustment of the latter.

The chapter on mental growth is concerned exclusively with the nature and development of intelligence. The conventional curves and tables are included and passing reference is made to the relationship of physical and mental growth. Many types of the latter are completely neglected. For example, there is no discussion of growth in understanding, in the ability to make inferences or apply principles or render judgments or solve problems. There is no discussion of the sort of growth that concerns many junior-high-school teachers greatly; namely, growth in academic learning.

The guidance program advocated should be "directed by the principal who is assisted by counselors and specialists as well as by homeroom teachers and regular classroom teachers," (p. 131). The authors sense that guidance, broadly defined, is education itself, but they recognize "a practical distinction . . . between formal and instruction procedures, and the newer guidance procedures," (p. 133). Most of this chapter describes practical administrative arrangements for providing guidance services in this sense. Especial attention is given the problems of exceptional children.

What the reviewer missed most in this treatise on the junior high school was a penetrating discussion of the way children learn. This topic is too important to be treated incidentally. Anyone wanting either to understand better the junior-high-school movement or to function better as a teacher or administrator in a junior high school should have insight into why and how children change their behavior. The word 'learning' does not even appear in the index.

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